

# **Crop Management for Efficient Potassium Use and Optimum Winegrape Quality**

**FREP Contract # 92-0627**

## **Project Leader**

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## **Objectives**

Evaluate approaches to improve vine K status on heavy soils that fix K

## **Summary**

Experiments were conducted at several sites in Sonoma (Carneros and Yountville) and Napa Valley (Healdsburg) to investigate different approaches to increasing the efficiency of K fertilizer use on clay soils, and to evaluate whether improved plant K status leads to improved efficiency of N fertilizer utilization. The problem of K deficiency on heavy soils creates a special need for efforts to improve efficiency because high application rates are often required to obtain plant responses.

The objectives were to test the potential of altered fertilizer placement, altered irrigation regimes, supplemental gypsum applications and selection of rootstocks in winegrapes for decreasing the need for high rates of fertilizer applications. High rates of potassium sulfate ( $K_2SO_4$ ) (8 lbs. or greater of  $K_2SO_4$  per vine) and supplemental irrigation (2 to 4 times the standard rate) to decrease K fixation and increase the availability of K for root uptake. This has successfully increased vine K status and maintained high K status beyond veraison. A slight increase in root growth in the upper 30 cm of soil due to both K and water applications may have contributed to increased K uptake. Augering holes next to vines (an expensive operation) has not increased vine K status above placement beneath drip emitters when evaluated at bloom, but the data suggest that auguring maintains high K status during fruit ripening.

Genetic approaches to manage these soils look promising. For Chardonnay vines on low K soils, vine K status was significantly greater on 5C and St. George rootstocks than on four other root systems. A wider range of genetic material that has little or no *Vitis vinifera* should be evaluated. Application of K to these vines increased juice pH on some rootstocks and in some years there has been a significant correlation between vine K status and juice pH. Use of gypsum +  $K_2SO_4$  increased soluble K in the soil, vine K status, and yield above that of the potash alone. The use of gypsum can be recommended when applying K on similar soils. At the Healdsburg Chardonnay site, treatments that combined N and K applications exhibited the greatest vine K status and yields.